

REMARKS

The Office rejected claims 1-6, 8-10 and 12-20 under 35 U.S.C. §103(a) over the combination of Desbois et al. '271 (U.S. Patent No. 6,825,271) and Desbois et al. '177 (U.S. Publication No. 2006/0058177). The Office also rejected claim 7 under 35 U.S.C. §103(a) over Desbois '271, Desbois '177 and Knoll et al. (U.S. Patent No. 6,593,430). In addition, the Office rejected claim 11 under 35 U.S.C. §112, second paragraph and 35 U.S.C. §101.

The disclosure relates to a process for the preparation of impact-resistant polystyrene from diene monomers and styrene monomers by anionic polymerization. The process involves preparing a rubber solution from diene monomer or from diene and styrene monomers using an alkali metal organyl compound as initiator in the presence of a solvent. Following the completion of the polymerization process which forms the rubber solution an organylaluminum compound and an alkali metal hydride are added to the rubber solution. Subsequently, styrene monomer is added to the rubber solution and the resultant mixture is polymerized anionically to give the impact-resistant polystyrene.

Applicants note that the organylaluminum compound and an alkali metal hydride are added AFTER the completion of the polymerization reaction which forms the rubber solution, and therefore, their role is not to act as initiators or retarders. Applicants found that surprisingly these additives reduce the viscosity of the rubber solution and to act as stabilizers (see page 8, lines 22-36 of the specification). The distinction between the claimed process and the cited references is that the organylaluminum compound and alkali metal hydride are added between the polymerization reactions. This process step is not taught or suggested by the cited references.

Desbois '271 describes a process for producing impact resistant polystyrene by anionic polymerization. As the Office notes on page 3 of the Office Action, an aluminum organyl compound may be added during the polymerization reaction to act as a retarder (column 3, lines 20-26 of Desbois '271).

However, the distinction between the claimed process and Desbois '271 is that Desbois '271 adds the aluminum organyl compound DURING the polymerization process whereas the claimed process adds the organylaluminum compound AFTER the polymerization process which forms the rubber solution. Accordingly, Desbois '271 does not teach or suggest the step of adding an organylaluminum compound and an alkali metal hydride to the rubber solution after stage 1) and prior to stage 2).

Desbois '177 describes an initiator composition and method for anionic polymerizations. The initiator contains an alkali metal hydride and an organylaluminum compound (see paragraph [0023]). Desbois '177 utilizes these compounds as initiators in the polymerization process. These compounds are added during the polymerization process not between polymerization reactions. Applicants note that following the described polymerization reactions (2a) in paragraph [0108] and (2b) in paragraph [0115] that methanol is added to terminate the polymerization reactions. The methanol destroys any remaining metal hydride or organoaluminum compounds. Thus, these compounds are not present in the reactor following the reaction (as they are in the claimed process). In addition, Desbois '177 does not teach or suggest adding these compounds after the formation of the polymer (rubber) solution. Instead the rubber solution which contains no metal hydride or organoaluminum compound is added to the styrene monomer followed by polymerization to form the final polymer (HIPS) (see 2c) paragraphs [0134] and [0135]. Accordingly, Desbois '177 does not teach or suggest the step of adding an organylaluminum compound and an alkali metal hydride to the rubber solution after stage 1) and prior to state 2).

In summary, the combination of Desbois '271 and Desbois '177 do not teach or suggest all the recitations of the claimed method, and accordingly, the claimed method would not have been rendered unpatentable under 35 U.S.C. §103(a) over the combination of Desbois '271 and Desbois '177. Therefore, Applicants respectfully request that the Office withdraw the rejection of claims 1-6, 8-10 and 12-20 under 35 U.S.C. §103(a) over the combination of Desbois '271 and Desbois '177.

Applicants submit that Knoll does not overcome the deficiencies of Desbois '271 and Desbois '177, and therefore, Applicants respectfully request that the Office withdraw the rejection of claim 7 under 35 U.S.C. §103(a) over Desbois '271, Desbois '177 and Knoll.

Finally, Applicants submit that the amendment to claim 11 obviates the rejections under 35 U.S.C. §112, second paragraph and 35 U.S.C. §101. Accordingly, Applicants request that the rejections be withdrawn.

In view of the above remarks, applicant believes the pending application is in condition for allowance. Favorable reconsideration is respectfully requested

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 12810-00337-US1 from which the undersigned is authorized to draw.

Dated: October 26, 2007

Respectfully submitted,
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